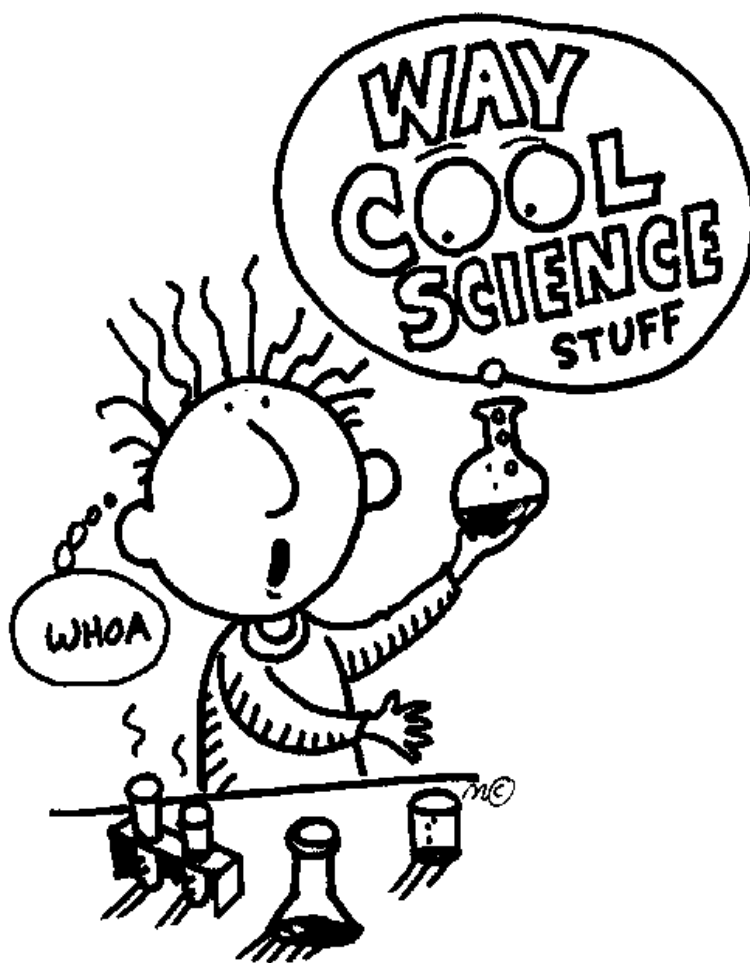


# Cedar Crest High School Science Fair Student Packet

2009-2010



Prepared by the  
Cedar Crest High School Science Department

## **Introduction to the CCHS Science Fair**

When dealing with scientific research, the scientist doesn't approach the problem with random tests, experiments, and conclusions. He or she follows a progression in which the question is logically dealt with. The problem is thoroughly researched. Hypotheses are developed based on that research. Experiments are carefully designed to test those hypotheses. Data from the experiment is analyzed and interpreted for meaning. Conclusions are drawn from this data and further research and experimentation is suggested. This process is known as the scientific method and is the basic guide for scientists doing research.

At Cedar Crest, the Science Department believes it is important for students in Honors level classes to conduct independent research using the scientific method. Doing so allows students to better understand a process that is common to all sciences. Participation in the CCHS Science Fair in 9<sup>th</sup>, 10<sup>th</sup>, and 11<sup>th</sup> grade honors science classes is required to receive honors level credit for that course.

## **Requirements for the CCHS Science Fair**

All projects should have the following items:

1. CASEF paperwork in a separate folder.
2. A journal (project data book) of all activities conducted.
3. A research paper with a works cited page.\*
4. An experiment paper which details the hypothesis, materials, data, etc.\*
5. The abstract.
6. A display board.\*
7. An interview on judging day. **THIS IS MANDATORY. You will only be excused from this requirement for school-sponsored activities.** Your teacher will assign class points for your attendance at your interview.

\*The items marked with an asterisk will be graded according to the rubrics found in this packet. Your teacher will assign due dates for these items:

Research Paper → Due:\_\_\_\_\_

Experiment Paper → Due:\_\_\_\_\_

Display Board → Due:\_\_\_\_\_

## Suggested Timeline

(Adapted from original by Mrs. Hopwood)

### September

- Science Fair is introduced in each class. This science fair packet is distributed to each student and discussed.
- Scientific method is reviewed.

### October

- Library time is scheduled. A minimum of one class day should be spent in the library to research.
- Choose a topic. Once a potential topic is found, the “Proposed Topic Form” should be completed, submitted to the teacher, and returned with comments and suggestions.
- Special forms are addressed.
- Special forms are due by **Wednesday, October 14, 2009**. A good place to learn about the special forms you need is [www.sciserv.org/isef/rules.asp](http://www.sciserv.org/isef/rules.asp).

### November

- Research should be completed and experimentation should begin.
- Students should keep a journal or log any notes, data, or observations during experimentation. This will be viewed by the judge at the science fair.
- Students should take pictures and document the entire process. This helps verify that work has been completed.

### December

- Complete experimentation.
- Discuss requirements of research paper, experimentation paper, and project display.
- Registration forms are due by **Wednesday, December 9, 2009**. These will be returned with the student's science fair number.

### January, February, and March

- Research paper is collected and graded using the attached rubric.
- Experimentation paper is collected and graded using the attached rubric.
- Students will sign up for interview times.
- Set-up of the display boards will be in the CCHS cafeteria on **Friday, January 29, 2010** from 3-7 pm. **NO SET-UP WILL BE ALLOWED AFTER 7 PM!**
- Judging will take place on **Saturday, January 30, 2010. THIS IS MANDATORY. You will only be excused from this requirement for school-sponsored activities.** Your teacher will assign class points for your attendance at your interview. Please plan accordingly.
- Open House will take place on **Sunday, February 1, 2009** from 1 – 3 pm.
- The Awards Ceremony will take place at 3 pm on **Sunday, January 31, 2010**. Students are encouraged to attend.
- **Projects should be torn down immediately after the Awards Ceremony. You are responsible for making arrangements to remove your project from the cafeteria if you are not present at the awards ceremony. Failure to do so may result in disciplinary action**
- CCHS Science Fair winners will be notified and receive information for CASEF.

## Common Mistakes Made by Science Fair Participants (And How to Avoid Them!)

(Adapted from original by Mrs. Hopwood)

<b>Mistake...</b>	<b>How to Avoid it...</b>
Inadequate references.	-You should have a minimum of five reliable sources. -Your sources should NOT all be from the Internet.
Too few trials of the experiment	-You should conduct <b>AT LEAST THREE</b> trials for your experiment.
Research is not thorough.	-All research should be conducted <b>before</b> you begin experimentation. -Try to exhaust as many sources as possible
Missing or incomplete project journal or log.	- <b>As you work</b> , you should complete notes, ideas, data, etc. in your journal or log. -Pictures should be taken to verify work.
Poor graphs.	-Every attempt should be made to graph data using computer software. -Graphs should be easy to read and understand. -Graphs should reflect that data measured. -The scale should be the same for all graphs so that accurate comparisons can be made. -Graphs should be labeled accurately so the viewer can easily understand the data presented.
Poor display boards.	-Your name/picture should <b>not</b> be on the project. -Every attempt should be made to generate work posted on the display board using a computer. -Items should be posted neatly and securely to the project board.
Too few test subjects.	<b>-If you are using human test subjects, you must have at least 50 participants!</b>
Poor research paper.	-Your paper should be written in 3 <sup>rd</sup> person, passive voice. -Your paper should be properly cited using the Cedar Crest MLA Style Guide.
Poor data.	-Your data should be quantitative (based on numerical values) rather than qualitative data. -All data should be measured using the metric system.
Inadequate or overall poor-quality project.	-As an <b>honors student</b> , you are expected to challenge yourself and do a project of high-quality. -Avoid poor projects like: “What is the effect of water on plants?” “Which do people prefer: Coke or Pepsi?” “Which (insert product here) is best?” “Which cookie has the most chocolate chips?”
Overall poor display, interview, etc.	-Have a clean, <u>unmarked</u> copy of your research paper and experiment paper at the display. -Look nice. Comb your hair. Brush your teeth. -Be able to answer the following question for your judge: “Tell me about your project.”

# Project Data Books

In settings such as science and engineering fairs where space and permitted equipment/materials are limited, the project data book becomes one of the most vital aspects of a science and engineering project. It becomes the lifeline between the actual experimentation and the results as indicated in the exhibit. In most cases, it is the only verifiable aspect of project results for the judging team.

Here are a few tips for preparing your project data book.

- Use a bound notebook in which pages cannot be removed; a loose-leaf or spiral notebook is not recommended. Information must be hand-written.
- It is important that things are written down as they occur. Write the results of your project immediately after every segment of the experiment. Sign your name and the date for each insertion.
- You may insert computer-generated graphs into your project book; however, you must initial over the edges to verify that it was entered on the date indicated.
- Project data books can become rather messy and students are often tempted to type their notebooks into report form. While it is a good idea to keep a computer backup of information, the project data book remains more important than a neatly typed copy. With today's technology, judges and others realize that it is very easy to falsely create computer files and date them retroactively.
- In many cases, it is advantageous to maintain two notebooks: one as the working copy (your project data book), and the other as the formal copy (your computer backup copy) where information is categorized and presented in an organized manner. Obviously, this creates additional work and students must pay attention to detail so that minute details are not overlooked as information is transcribed. Students may present a typed version of their working notebook as long as the original working copy accompanies it.
- Please remember that any materials prepared for the Capital Area Science and Engineering Fair may not include any identifying information, such as your name and school, to ensure fair judging. No identifying information should be included in your project data book.

## Did you know...?

Project data books are legally admissible evidence for cases of patent issuance and patent infringement. The information contained in the project data book verifies the identity of the scientist or engineer, the originality of the material, and a time frame for when the work was completed.

### **Proposed Topic Form**

Name\_\_\_\_\_ Period\_\_\_\_\_

Proposed topic or question to research:

Brief description of methods to be used in research:

Identify any potential problems or special materials to be used:

Comments from teacher (to be done by the teacher):

## **Specific Guidelines for Science Fair Requirements**

### **I. Research Paper (50 points)**

- Your research paper should thoroughly investigate knowledge about and past research on your topic. It will also include information about how YOU plan on experimenting and YOUR hypothesis.
- It should be 4 – 5 pages in length, double-spaced, and be written in a reasonable-sized and readable font such as Times New Roman or Courier.
- Your paper should cite at least five reliable sources and they should all NOT be from the Internet.
- You should include internal citations and a works-cited page.

### **II. Experimentation Paper (50 points)**

- Your experimentation paper will detail the parts of the scientific method that you used while investigating your project. It will follow the guidelines of a lab report like you might write in class.
- The general components of a lab report that should be included are as follows:
  - **TITLE:** A clear and concise statement of the problem being studied.
  - **INTRODUCTION:** Includes a hypothesis about what you believe will happen during the investigation. Remember, a hypothesis is based on *your prior research knowledge*. It is not a guess. A hypothesis is supported by the knowledge in your research paper.
  - **MATERIALS:** Materials that you used are listed *in detail*.
  - **PROCEDURE:** The procedure should be written with enough detail that someone else could replicate your work exactly as you have done it.
  - **DATA:** Charts and graphs should be used to convey the data you collected. All data should be labeled and graphs should be computer generated.
  - **CALCULATIONS:** Show any calculations that you have completed to obtain results.
  - **CONCLUSIONS:** The conclusion should contain an answer to the question you stated in the introduction. Conclusions should be based on your results and data. Remember that your results may not support your hypothesis, but this is also important to note. Suggestions for further study should be included. Experimental errors should be addressed and explained.

### **III. Science Fair Display Board (40 points)**

- Your science fair display board should neatly and concisely reflect the components of your investigation.
- The title, hypothesis, procedures, results, and conclusions should all be displayed.
- All words should be spelled properly. It should be neat and visually appealing. Evidence of individual work through pictures and documentation (like your journal or log) should be present.
- Your abstract form should also be present at the display.
- Your research paper should be present at the display.
- Your journal (project data book) should be present at the display.

**Your teacher will give you a due date for each of the above assignments.  
A deduction of 10% per day will be assessed to assignments turned in late.**

## Grading Rubric: Research Paper (50 Points)

<b>Category</b>	<b>Excellent</b>	<b>Satisfactory</b>	<b>Needs Improvement</b>	<b>Unsatisfactory</b>
<i>Technical Qualities, Spelling, and Grammar (8 points)</i>	<ul style="list-style-type: none"> <li>• Four to five pages.</li> <li>• Reasonable size font.</li> <li>• Readable font.</li> <li>• No punctuation errors.</li> <li>• Well-written introduction.</li> <li>• Well-written conclusion.</li> <li>• Logical organization.</li> <li>• Double spaced.</li> <li>• 3<sup>rd</sup> person passive voice.</li> <li>• Spell check performed.</li> <li>• Varied sentence structure.</li> <li>• Correct grammar used.</li> </ul> <p style="text-align: right;"><b>7-8</b></p>	<ul style="list-style-type: none"> <li>• Three to four pages.</li> <li>• Reasonable size font.</li> <li>• Readable font.</li> <li>• Few punctuation errors.</li> <li>• Adequate introduction.</li> <li>• Adequate conclusion</li> <li>• Few organizational issues.</li> <li>• Double spaced.</li> <li>• Some attempt at 3<sup>rd</sup> person passive voice.</li> <li>• One or two spelling errors present.</li> <li>• Somewhat varied sentence structure.</li> <li>• One or two grammar errors present.</li> </ul> <p style="text-align: right;"><b>5-6</b></p>	<ul style="list-style-type: none"> <li>• Two to three pages.</li> <li>• Font size too large or small.</li> <li>• Font is approaching difficult to read.</li> <li>• Several punctuation errors.</li> <li>• Inadequate introduction.</li> <li>• Inadequate conclusion.</li> <li>• Disorganized.</li> <li>• Not double spaced.</li> <li>• Minimal use of 3<sup>rd</sup> person passive voice.</li> <li>• Several spelling errors.</li> <li>• An attempt to vary sentence structure has been made.</li> <li>• Several grammar errors.</li> </ul> <p style="text-align: right;"><b>3-4</b></p>	<ul style="list-style-type: none"> <li>• Less than 2 pages.</li> <li>• Font size too large or small.</li> <li>• Font is difficult to read.</li> <li>• Many punctuation errors.</li> <li>• No or poorly-written introduction.</li> <li>• No or poorly-written conclusion.</li> <li>• Disorganized and incoherent.</li> <li>• Not double spaced.</li> <li>• No attempt at 3<sup>rd</sup> person passive voice.</li> <li>• Numerous spelling errors.</li> <li>• Little or no attempt to vary sentence structure.</li> <li>• Numerous grammar errors.</li> </ul> <p style="text-align: right;"><b>1-2</b></p>
<i>Resources (12 points)</i>	<ul style="list-style-type: none"> <li>• Five or more sources used.</li> <li>• Sources are reliable.</li> <li>• Sources represent substantial research.</li> <li>• Sources come from a variety of locations.</li> <li>• Not all from the Internet.</li> <li>• Internal citations used.</li> <li>• Complete works cited page.</li> </ul> <p style="text-align: right;"><b>11-12</b></p>	<ul style="list-style-type: none"> <li>• Three or four sources used.</li> <li>• Sources are reliable.</li> <li>• Sources come from a variety of locations.</li> <li>• Internal citations used.</li> <li>• Complete works cited page.</li> </ul> <p style="text-align: right;"><b>9-10</b></p>	<ul style="list-style-type: none"> <li>• Two or three sources used.</li> <li>• Sources do not have high reliability.</li> <li>• Sources are from similar locations.</li> <li>• Heavy reliance on the Internet.</li> <li>• Internal citations are used sporadically or improperly.</li> <li>• Incomplete works cited page.</li> </ul> <p style="text-align: right;"><b>6-8</b></p>	<ul style="list-style-type: none"> <li>• One or two sources used.</li> <li>• Highly questionable sources used.</li> <li>• Sources are all from the Internet.</li> <li>• No internal citations.</li> <li>• Works cited page is not present.</li> </ul> <p style="text-align: right;"><b>1-5</b></p>
<i>Topic (10 points)</i>	<ul style="list-style-type: none"> <li>• Topic shows creativity.</li> <li>• Proposed topic is credible and shows merit.</li> <li>• Data can be measured quantitatively.</li> <li>• Topic represents the intellectual sophistication of an HONORS student.</li> </ul> <p style="text-align: right;"><b>9-10</b></p>	<ul style="list-style-type: none"> <li>• Topic shows some creativity.</li> <li>• Proposed topic shows some credibility.</li> <li>• Data can be measured quantitatively.</li> <li>• Topic is sophisticated enough for an HONORS student.</li> </ul> <p style="text-align: right;"><b>7-8</b></p>	<ul style="list-style-type: none"> <li>• Topic shows little creativity.</li> <li>• Proposed topic shows little credibility.</li> <li>• Most data can be measured quantitatively.</li> <li>• HONORS level sophistication is lacking.</li> </ul> <p style="text-align: right;"><b>5-6</b></p>	<ul style="list-style-type: none"> <li>• Topic is not creative.</li> <li>• Proposed topic shows no credibility.</li> <li>• No quantitative data can be collected.</li> <li>• The topic shows no sophistication for an HONORS level student.</li> </ul> <p style="text-align: right;"><b>1-4</b></p>
<i>Method for Proposed Investigation (10 points)</i>	<ul style="list-style-type: none"> <li>• Proposed method has been thoroughly investigated.</li> <li>• Several sources are cited that support proposed research.</li> <li>• Needed materials have been investigated.</li> <li>• Availability of materials has been determined.</li> </ul> <p style="text-align: right;"><b>9-10</b></p>	<ul style="list-style-type: none"> <li>• Proposed method has been investigated.</li> <li>• One source is cited that supports proposed research.</li> <li>• Needed materials have been investigated.</li> <li>• Availability of materials has not been determined.</li> </ul> <p style="text-align: right;"><b>7-8</b></p>	<ul style="list-style-type: none"> <li>• Proposed method has been mentioned but not researched.</li> <li>• Sources do not support the proposed method of research.</li> <li>• Needed materials have not been investigated thoroughly.</li> </ul> <p style="text-align: right;"><b>5-6</b></p>	<ul style="list-style-type: none"> <li>• Proposed method has not been investigated or may not be present.</li> <li>• No sources support the proposed research.</li> <li>• Needed materials have not been investigated</li> </ul> <p style="text-align: right;"><b>1-4</b></p>
<i>Hypothesis for Proposed Investigation (10 points)</i>	<ul style="list-style-type: none"> <li>• The hypothesis is based on significant, <u>credible</u> research.</li> <li>• The hypothesis relates directly to the question.</li> </ul> <p style="text-align: right;"><b>9-10</b></p>	<ul style="list-style-type: none"> <li>• The hypothesis is based on research.</li> <li>• The hypothesis relates to the question.</li> </ul> <p style="text-align: right;"><b>7-8</b></p>	<ul style="list-style-type: none"> <li>• The hypothesis is based on questionable research.</li> <li>• The hypothesis is not sufficiently related to the question.</li> </ul> <p style="text-align: right;"><b>5-6</b></p>	<ul style="list-style-type: none"> <li>• The hypothesis is not based on research.</li> <li>• The hypothesis is not related to the question.</li> </ul> <p style="text-align: right;"><b>1-4</b></p>



## **Grading Rubric: Experimentation Paper (50 Points)**

<b>Category</b>	<b>Excellent</b>	<b>Satisfactory</b>	<b>Needs Improvement</b>	<b>Unsatisfactory</b>
<i>Organization, Technical Qualities, Spelling and Grammar (8 points)</i>	<ul style="list-style-type: none"> <li>Paper is logically organized.</li> <li>Written in the format given for lab reports.</li> <li>Spell check performed; errors corrected.</li> <li>Grammatically correct.</li> <li>Sentence structure varies in length and format.</li> <li>Paper is typed in a readable and reasonable sized font.</li> <li>Paper is written in 3<sup>rd</sup> person, passive voice.</li> </ul> <p style="text-align: right;"><b>7-8</b></p>	<ul style="list-style-type: none"> <li>Paper has organizational problems.</li> <li>Varies slightly from the format given for lab reports.</li> <li>One or two spelling or grammar errors present.</li> <li>Sentence structure and length are somewhat varied.</li> <li>Paper is typed in a readable and reasonable sized font.</li> <li>Some attempt has been made to use 3<sup>rd</sup> person, passive voice.</li> </ul> <p style="text-align: right;"><b>5-6</b></p>	<ul style="list-style-type: none"> <li>Paper is disorganized.</li> <li>Barely follows the given format for lab reports.</li> <li>Several spelling and grammar errors present.</li> <li>A minimal attempt to vary sentence structure and length has been made.</li> <li>Little attempt to use 3<sup>rd</sup> person, passive voice.</li> </ul> <p style="text-align: right;"><b>3-4</b></p>	<ul style="list-style-type: none"> <li>Paper is disorganized and incoherent.</li> <li>No attempt has been made to follow the format given for lab reports.</li> <li>Numerous spelling and grammar errors present.</li> <li>Similar sentence structure and length is used throughout the paper.</li> <li>No attempt to use 3<sup>rd</sup> person, passive voice.</li> </ul> <p style="text-align: right;"><b>1-2</b></p>
<i>Title, Introduction, Hypothesis, and Materials (10 points)</i>	<ul style="list-style-type: none"> <li>Title represents a clear, concise statement of the question studied.</li> <li>A statement of the hypothesis is included that indicates what the student believes will happen.</li> <li>A detailed list of materials is present.</li> </ul> <p style="text-align: right;"><b>9-10</b></p>	<ul style="list-style-type: none"> <li>The title is clear, but may not completely reflect the question studied.</li> <li>The hypothesis statement is included but may not be relevant to the problem.</li> <li>Materials are included but not in detail.</li> </ul> <p style="text-align: right;"><b>7-8</b></p>	<ul style="list-style-type: none"> <li>A title is present but does not reflect the question being studied.</li> <li>The hypothesis is not relevant to the problem.</li> <li>Materials are included but not in detail.</li> </ul> <p style="text-align: right;"><b>5-6</b></p>	<ul style="list-style-type: none"> <li>The title is not present.</li> <li>A hypothesis is not included.</li> <li>There is no materials list included.</li> </ul> <p style="text-align: right;"><b>1-4</b></p>
<i>Procedures (10 points)</i>	<ul style="list-style-type: none"> <li>Procedures are written in enough detail so that someone else could easily replicate the experiment.</li> <li>Diagrams and/or pictures are present if necessary.</li> <li>Three or more trials have been done.</li> <li>A control is present.</li> <li>Variables are controlled.</li> </ul> <p style="text-align: right;"><b>9-10</b></p>	<ul style="list-style-type: none"> <li>Procedures are detailed. Someone else could replicate the experiment with slight difficulty.</li> <li>Diagrams and/or pictures may be confusing or incomplete.</li> <li>Three trials have been done.</li> <li>An attempt to control variables has been made.</li> </ul> <p style="text-align: right;"><b>7-8</b></p>	<ul style="list-style-type: none"> <li>Procedures are written so that someone else would have some difficulty in replicating the experiment.</li> <li>There are minimal diagrams and/or pictures present.</li> <li>Two trials have been done.</li> <li>A control may not be accounted for.</li> <li>Some variables were not accounted for and not controlled.</li> </ul> <p style="text-align: right;"><b>5-6</b></p>	<ul style="list-style-type: none"> <li>Procedures are not detailed. It would be difficult for someone to follow the procedures.</li> <li>There are no diagrams and/or pictures.</li> <li>Only one trial has been done.</li> <li>There is no control.</li> <li>Variables are not controlled.</li> </ul> <p style="text-align: right;"><b>1-4</b></p>
<i>Data and Calculations (10 points)</i>	<ul style="list-style-type: none"> <li>Data is quantitative.</li> <li>Data is expressed in scientific terms.</li> <li>The metric system has been used.</li> <li>Data has been collected to the correct level of precision.</li> <li>All data is presented, even faulty data.</li> <li>Other qualitative data is used in support of quantitative data.</li> </ul> <p style="text-align: right;"><b>9-10</b></p>	<ul style="list-style-type: none"> <li>Data is mostly quantitative.</li> <li>Most data is expressed scientifically.</li> <li>The metric system has been used.</li> <li>Some data may not have been collected to the correct level of precision.</li> <li>Other qualitative data may be presented but not used or interpreted.</li> </ul> <p style="text-align: right;"><b>7-8</b></p>	<ul style="list-style-type: none"> <li>Some data is quantitative but a few quantitative measurements are present.</li> <li>Some data does not use the metric system.</li> <li>Some data has been collected using the wrong level or precision.</li> <li>There is too much reliance on interpreting qualitative data.</li> </ul> <p style="text-align: right;"><b>5-6</b></p>	<ul style="list-style-type: none"> <li>Data is mostly qualitatively.</li> <li>Measurements were made using the English Standard system.</li> <li>Significant errors are present in collecting data to the correct level of precision.</li> </ul> <p style="text-align: right;"><b>1-4</b></p>
<i>Conclusions (12 points)</i>	<ul style="list-style-type: none"> <li>The question stated in the title and introduction is present.</li> <li>Based on results.</li> <li>Faulty or misleading data is examined and explained.</li> <li>Experimental errors are examined and explained.</li> <li>Significant suggestions for further work.</li> </ul> <p style="text-align: right;"><b>11-12</b></p>	<ul style="list-style-type: none"> <li>The question stated in the title and introduction is present.</li> <li>Based mostly on results.</li> <li>Some examination and explanation of faulty or misleading data is present.</li> <li>Some examination and explanation of experimental errors is present.</li> <li>Some suggestions for further work.</li> </ul> <p style="text-align: right;"><b>9-10</b></p>	<ul style="list-style-type: none"> <li>A minimal attempt to answer the question is made.</li> <li>May not be based on results.</li> <li>Minimal attempt has been made to explain faulty and misleading data.</li> <li>Minimal attempt has been made to explain experimental error.</li> <li>Few or no suggestions for further work.</li> </ul> <p style="text-align: right;"><b>6-8</b></p>	<ul style="list-style-type: none"> <li>The question studied is not answered.</li> <li>Not based on results.</li> <li>Faulty and misleading data is not examined or explained.</li> <li>No explanation of experimental errors.</li> <li>No suggestions for further work.</li> </ul> <p style="text-align: right;"><b>1-5</b></p>

## **Grading Rubric: Display Board (40 Points)**

<b>Category</b>	<b>Excellent</b>	<b>Satisfactory</b>	<b>Needs Improvement</b>	<b>Unsatisfactory</b>
<i>Title</i> (4 points)	<ul style="list-style-type: none"> <li>The title accurately reflects the project and the question studied..</li> </ul> <b>4</b>	<ul style="list-style-type: none"> <li>The title is present and reflects the project</li> </ul> <b>3</b>	<ul style="list-style-type: none"> <li>The title does not reflect the project appropriately.</li> </ul> <b>2</b>	<ul style="list-style-type: none"> <li>The title is not present.</li> </ul> <b>1</b>
<i>Abstract</i> (4 points)	<ul style="list-style-type: none"> <li>The abstract is present.</li> <li>The abstract is neatly written or typed.</li> <li>The summary is a logical progression from hypothesis to conclusion.</li> </ul> <b>4</b>	<ul style="list-style-type: none"> <li>The abstract is present.</li> <li>The abstract is somewhat neatly written or typed.</li> <li>The summary is written to show some progression from hypothesis to conclusion.</li> </ul> <b>3</b>	<ul style="list-style-type: none"> <li>The abstract is present.</li> <li>The abstract is written sloppily.</li> <li>The summary does not reflect a progression from hypothesis to conclusion.</li> </ul> <b>2</b>	<ul style="list-style-type: none"> <li>The abstract is not present.</li> </ul> <b>1</b>
<i>Hypothesis</i> (4 points)	<ul style="list-style-type: none"> <li>The hypothesis is clearly stated.</li> <li>It specifies what results are expected.</li> </ul> <b>4</b>	<ul style="list-style-type: none"> <li>The hypothesis states results that are expected.</li> </ul> <b>3</b>	<ul style="list-style-type: none"> <li>The hypothesis does not clearly state results that are expected.</li> <li>It may not relate to the question.</li> </ul> <b>2</b>	<ul style="list-style-type: none"> <li>A hypothesis is not present or is clearly not related to the question.</li> </ul> <b>1</b>
<i>Procedure</i> (4 points)	<ul style="list-style-type: none"> <li>Procedures are written clearly.</li> <li>The viewer can identify major steps involved in the process.</li> <li>Diagrams and/or pictures are present to help clarify procedures.</li> </ul> <b>4</b>	<ul style="list-style-type: none"> <li>Procedures are written in enough detail that the viewer can identify most major steps involved in the process.</li> <li>Diagrams and/or pictures may be present but not necessarily helpful in clarifying the procedure.</li> </ul> <b>3</b>	<ul style="list-style-type: none"> <li>Procedures are poorly written.</li> <li>The viewer has a difficult time determining the major steps involved in the process.</li> <li>Diagrams and/or pictures do not necessarily help clarify the procedures.</li> </ul> <b>2</b>	<ul style="list-style-type: none"> <li>Procedures are sparse in detail.</li> <li>The viewer has great difficulty identifying major steps involved in the process.</li> </ul> <b>1</b>
<i>Results</i> (4 points)	<ul style="list-style-type: none"> <li>Results are presented in clear tabular and/or graphical format.</li> <li>Graphs and charts are clearly labeled.</li> <li>All results are presented.</li> </ul> <b>4</b>	<ul style="list-style-type: none"> <li>Results are presented in tabular and/or graphical format.</li> <li>Graphs and charts are labeled.</li> <li>Most results are presented.</li> </ul> <b>3</b>	<ul style="list-style-type: none"> <li>Results presented in tabular and/or graphical format are confusing.</li> <li>Labels on graphs and charts are misleading.</li> <li>Significant results may not be present.</li> </ul> <b>2</b>	<ul style="list-style-type: none"> <li>Results are not in tabular and/or graphic format or not present at all.</li> <li>Graphs and charts are not labeled.</li> </ul> <b>1</b>
<i>Conclusions</i> (4 points)	<ul style="list-style-type: none"> <li>An answer to the question is stated.</li> <li>Sufficient examination of data, error, and further research is stated.</li> </ul> <b>4</b>	<ul style="list-style-type: none"> <li>An answer to the question is stated.</li> <li>Some examination of data, error, and further research is stated.</li> </ul> <b>3</b>	<ul style="list-style-type: none"> <li>The question is insufficiently answered.</li> <li>Little examination of data, error, and further research is stated.</li> </ul> <b>2</b>	<ul style="list-style-type: none"> <li>Conclusions are not present or deviate from answering the question stated.</li> <li>No examination of data, error, and further research is included.</li> </ul> <b>1</b>
<i>Spelling, Grammar, and Technical Qualities</i> (4 points)	<ul style="list-style-type: none"> <li>Material on the display board has been computer generated.</li> <li>No spelling errors.</li> <li>Proper grammar has been used.</li> </ul> <b>4</b>	<ul style="list-style-type: none"> <li>Material on the display board has been computer generated.</li> <li>Few spelling and grammar errors.</li> </ul> <b>3</b>	<ul style="list-style-type: none"> <li>Most of the material on the display board has been computer generated.</li> <li>Noticeable spelling and grammar errors.</li> </ul> <b>2</b>	<ul style="list-style-type: none"> <li>Material on the display board has been hand written.</li> <li>Many spelling and grammar errors.</li> </ul> <b>1</b>
<i>Evidence of Work</i> (4 points)	<ul style="list-style-type: none"> <li>Evidence is present that the project was an individual endeavor through photos and or a valid research notebook.</li> </ul> <b>4</b>	<ul style="list-style-type: none"> <li>There is some evidence that the project was an individual endeavor. Photos and research notebook may not be sufficient to show validity.</li> </ul> <b>3</b>	<ul style="list-style-type: none"> <li>There is very little evidence that the project was done individually. The viewer has doubt that photos and/or a research notebook are valid.</li> </ul> <b>2</b>	<ul style="list-style-type: none"> <li>There is no evidence that the project was completed individually. There are no photos or valid research notebook.</li> </ul> <b>1</b>
<i>Organization</i> (4 points)	<ul style="list-style-type: none"> <li>Display board is neat and well organized.</li> <li>Items are securely attached.</li> <li>All items are clearly labeled.</li> </ul> <b>4</b>	<ul style="list-style-type: none"> <li>Display board is neat and organized.</li> <li>Items are securely attached.</li> <li>Most items are labeled.</li> </ul> <b>3</b>	<ul style="list-style-type: none"> <li>Display board is not neat or poorly organized.</li> <li>Items on the board may be loose.</li> <li>Labels are present but not useful.</li> </ul> <b>2</b>	<ul style="list-style-type: none"> <li>Display board is sloppy.</li> <li>Items on the board may be falling off.</li> <li>There are no labels.</li> </ul> <b>1</b>
<i>Journal</i> (4 points)	<ul style="list-style-type: none"> <li>Journal is present and follows all guidelines in this packet.</li> </ul> <b>4</b>	<ul style="list-style-type: none"> <li>Journal is present and follows most guidelines in this packet.</li> </ul> <b>3</b>	<ul style="list-style-type: none"> <li>Journal is present but follows few of the guidelines in this packet.</li> </ul> <b>2</b>	<ul style="list-style-type: none"> <li>Journal is present but does not follow the guidelines in this packet.</li> </ul> <b>1</b>